intensity of cropping since the area covered by perennial crops, which is quite large in the case of Kerala, is irrelevant from the point of view of double or triple cropping. It will thus be seen that not only is the proportion of cultivable area to total area high in Kerala, but the degree of utilization of the cultivated area is also quite high.

FIELD CROPS

2.12 The techniques of cultivation as well as the economics of field crops differ widely from that of commercial plantation crops. The field crops are generally characteristic of the subsistence economy whereas the latter are largely market-oriented. Moreover, unlike field crops the plantation crops are perennial and do not require annual repetition of preliminary agricultural operations like ploughing, sowing, etc. The returns too vary widely. Field crops and plantations are, therefore, discussed separately in the pages that follow.

Cropping Pattern and Yields of Field Crops

2.13 Rice, the most important field crop, occupies a prominent place in the agricultural economy of Kerala. In 1958-59, it covered 1.9 million acres out of 2.7 million acres under field crops. The production of rice in the same year was 939,000 tons. While the rice acreage fell by only 0.4 per cent during 1951–59, its production during the same period leapt up by over 31 per cent. Increase in the yield rate during the same period was from 829 to 1,108 lbs. per acre (Table 11). The growing appreciation among farmers of the utility of fertilizers, improved seeds and better techniques of cultivation is largely responsible for this steady improvement.

2.14 Next to rice, tapioca is the most important field crop of Kerala. During 1951–59, the area under the crop increased from 506,000 acres to 553,000 acres, that is by 11 per cent. The production of tapioca in 1958-59 was 1.5 million tons, that is, an increase of 4.6 per cent over 1950-51.

2.15 Tapioca and rice considered together, account for over 54 per cent of the net sown area which is the same as 90 per cent of the area under field crops. Among the remaining field crops, ginger, groundnut, sesamum, sugarcane and pulses are the most important ones. Ginger is primarily an export crop, and its fortunes fluctuate with the trend of foreign markets. During the recent years, the area under ginger has steadily declined from 30,000 acres in 1950-51 to 22,000 acres in 1958-59. Other field crops, however, have shown significant increases in area over the same period. The rate of increase is the highest for sugarcane, where it rose from mere 2,000 to 22,000 acres—an increase of 1,000 per cent in less than a decade. This is due to the commissioning of a sugar factory (900 tons crushing capacity per day) at Thiruvella in 1954. The output of sugarcane, however, rose by only 775 per cent. The next highest increase has been in pulses where the area rose by 287 per cent between 1951 and 1939. Pulses, with the exception of *tur* (*Cajanus indica*), are now increasingly raised as second or even third crop by availing of the moisture left in the soil after the harvest of paddy. This development owes

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EXTENSION OF CULTIVABLE AREA

Cotton

2.25 Prior to 1956, Kerala was considered unsuitable for the cultivation of cotton. In that year an experiment was made on a pilot scale and the results were so encouraging that the area under Sea Island (long staple) cotton rose from 126 acres in 1956 to about 3,500 acres in 1959-60.

2.26 Sea Island cotton yields superior lint which can be spun into high count expensive yarn. The latter finds a good market within the country and at present has even got to be imported. The extension of area under this crop will help in saving valuable foreign exchange and it would also provide scope for development of such industries as ginning, baling, spinning and cotton seed oil extraction.

2.27 In view of the above factors it is desirable to undertake further extension of area under cotton. A part of this increase can take place at the expense of acreage under tapioca, which is a low yielding crop. About 0.2 to 0.3 million acres out of 0.56 million acres under tapioca can be diverted in this way during the next decade. Efforts should, however, be made to keep the output of tapioca at the existing level by raising its yield which is at a very low level.

2.28 There is also scope for diverting some highland area under single cropped paddy to Sea Island cotton since such a diversion would yield high returns in terms of value. The exact scope for such a diversion can, however, be ascertained only after the proposed land-use survey has been conducted.

2.29 Assuming 0.3 million acres are brought under Sea Island cotton, as suggested above, additional production of long staple cotton may be expected to reach a level of 192,000 bales by 1970-71.

Sugarcane

2.30 Sugarcane is a high value crop, and, therefore, is quite popular with the farmers. But it is one of those crops whose future extension of area is very much dependent upon the growth of sugar manufacturing industry. Its exact scope will, therefore, depend upon the growth of sugar factories.

2.31 The yield per acre of sugarcane in Kerala is very good (Kerala 40,000 lbs. per acre ; U.P. and Bihar 25,000 lbs. per acre ; all-India 28,000 lbs. per acre) and can be raised to 55,000 lbs. per acre. This factor favours the extension of sugarcane cultivation and the setting up of new sugar mills. At present there are about 25,000 acres under this crop in Thiruvella area, mostly concentrated around the Pampa river sugarcane factory. There is scope for a large increase in sugarcane acreage in the districts of Palghat, Trivandrum and Ernakulam which possess the requisite irrigation facilities. By 1971, the area under sugarcane may be doubled to about 50,000 acres.

Ginger

2.32 Ginger is a very high value yielding crop (Rs. 1,077 per acre). In view of good demand prospects for ginger in both internal and external markets, the production of

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acres to 270,625 acres. This is a proof of the growing popularity of rubber cultivation in Kerala. Increase has also been registered in the tapped area. During 1951–56, the tapped area increased by about 50 per cent (99,120 to 150,000 acres), though the acreage under rubber increased only by 25 per cent. A higher rate of increase in case of tapped area has been caused by maturing of trees planted before 1951.

2.106 *Distribution of Holdings*: The increase in the number of holdings since 1951 has been much more than the increase in acreage under rubber. There were 50,000 estates in 1958 as against 9,026 in 1951. The increase was roughly 500 per cent as against an increase in the area by about 100 per cent only. The consequence is that today rubber industry in Kerala is marked by the existence of a large number of small-size family estates. The increase in area under small estates is not a healthy trend, as these are uneconomic and have low productivity.

2.107 *Production and Yields*: During 1958, the total production of rubber in Kerala was 22,200 tons. The production has been steadily rising at a rate of 8.2 per cent per annum which is indeed a very high rate when compared with growth in the gross agricultural production. (Table 13)

2.108 In 1958 the yield per acre of rubber in Kerala was 294 lbs. which is very low when compared to the yields in Malaya, Ceylon, Indonesia and other rubber growing countries. Compared to 1958, the yield in 1951 was slightly higher standing at 312 lbs. per acre. The decline in yield was partly due to the transfer of Kanyakumari district, which was a high yielding region, to Madras after the reorganization of the States. Partly it was also due to large scale new planting in all the districts except Trichur.

2.109 A significant fact about land productivity is the wide difference in yield rates between big and small estates. In 1958, the average yield of holdings of below 100 acres was only 162 lbs. per acre while in larger holdings it was 486 lbs.

2.110 Low productivity in smaller gardens is due to the inefficient and unscientific manner in which the estates are managed and lack of resources at the disposal of these estate owners. Scientific and efficient management of rubber gardens requires manuring of gardens, periodic renewal of fences, clearance of under-growth, control of soil erosion, etc. For carrying out these operations, it is necessary to have a large fund of working capital which the small growers do not possess. Small growers, particularly those with 10 acres and less, have very little sustaining power and cannot wait for the trees to attain maturity. Consequently, premature tappings and slaughter tappings are too common among the small estates. The small holders are also tempted to grow an understorey when the plants are young and for that they generally prefer tapioca as it is a food crop with high yields. Under cropping even when properly manured, is not good for the soil but when it is considered along with inadequate manuring, the harm can well be imagined. This type of mismanagement generally does not occur in large plantations. It is high time that something is done to improve the situation. Measures such as amalgamating small units into an economic size and working them on a cooperative basis would perhaps meet the needs. The matter should be further investigated and followed up by suitable action.

2.111 The low yield per acre is also due to the cultivation of low yielding varieties and over-ageing of trees. The Rubber Board reported that at the end of 1955, 80

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large estates. The small holdings, as explained before, are not economical and have low yields. It is, therefore, necessary to make adequate safeguards against the creation of small units.

2.116 Moreover, care should be taken to see that all future plantings are done with improved clones. This can be much better ensured if departmental planting and working of the estates by Forest Department is undertaken instead of leasing the land under Government ownership to individual growers. It may be assumed that out of 3 lakh acres of proposed plantations, 2 lakh acres would be under Government management and the rest would be planted by private growers. The programme may be phased at the rate of 30,000 acres per year. The total investment for the whole programme would thus be Rs. 75 crores.

2.117 In well-managed estates, the trees begin to yield after seven years. Assuming that the new plantings yield at an average rate of 700 lbs. of rubber per acre, the output of rubber from these would increase progressively from 9,380 tons to 37,520 tons in 1971. Full results from the proposed 3 million acres of new plantings would be visible only from 1978 onwards at the rate of additional 93,800 tons per annum.

Pepper

2.118 The cultivation of pepper in India is almost entirely concentrated in this State which produces over 95 per cent of the country's total output. During 1958 India produced about 27,000 tons of pepper, approximately 45 per cent of the overall world production. Before World War II, Indonesia was the leading producer and exporter of pepper, but since then India has assumed that role. Between 1939 and 1951 production of pepper in the country increased by 16 per cent.

2.119 Large scale cultivation of pepper is confined only to the submountain tracts on or below the Western Ghats. It is also grown in the plains but as a protected garden crop in the compounds of houses and not as a plantation crop. Pepper is a perennial climbing crop and lasts for 20 to 30 years. There are on an average 300 to 400 standards (pepper bushes) per acre. On an average, each standard under plantation conditions yields 1 to 2 lbs.; but it is not uncommon to find standards in house compounds yielding even 40 to 50 lbs.

2.120 As in the case of coconut, it is difficult to arrive at a correct estimate of the area under pepper. The estimate prepared by the Directorate of Statistics in Kerala is of the order of 224,658 acres for 1957-58. Of this, Malabar region accounted for 136,854 acres and the rest were in Travancore-Cochin area. The output of pepper during the same year was 26,020 tons in the whole of Kerala, of which the share of Malabar region was 42 per cent. Malabar with over 60 per cent of the area under pepper produces only 42 per cent of the output.

2.121 Per acre yield was the highest in Alleppey and Quilon (402 lbs. per acre) followed by the districts of Trichur, Ernakulam, Trivandrum and Kottayam (375 to 381 lbs. per acre). Malabar region has comparatively very low yields (180 lbs. per acre). This may, perhaps, be due to cultivation of pepper in Malabar on extensive rather than on intensive lines.

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2.122 The development of pepper has not been receiving adequate attention. The crop was practically neglected during the First Plan. However, the high price of pepper which prevailed during early fifties provided a good incentive for extension of the area under pepper. The main work during the Second Plan was directed towards establishment of nurseries, extending the area under the crop and replacement of unthrifty vines with better ones. A total of 2,000 acres have been replanted so far.

2.123 It is possible to increase the yield of pepper from the present level of above one lb. to 2 or 3 lbs. per standard through intensive cultivation, better manuring, better varieties, and plant protection measures, especially against *pollu* disease. Manuring of pepper has been a neglected field and with the application of fertilizer mixtures (3 cwts. of ammonium sulphate + 4.5 cwts. of super phosphate + 1 cwt. of muriate of potash per acre) the existing yields could be almost doubled within a year. Moreover, some extension of area under pepper vines can also take place in house compounds, as an inter-crop in small holdings and in tea and rubber plantations on land unsuited for the main crop.

2.124 Since pepper is primarily an export commodity, 75 per cent of the produce being annually sent out of India, its future scope is very much dependent on the foreign markets. After the last war, India emerged as a major exporter of pepper in the world. The USA was our largest importer, accounting for over 70 per cent of our exports. But, of late, other countries such as Indonesia, Sarawak and Malaya have begun to export larger quantities and as a consequence, the USA, now accounts for only about 20 per cent of our exports. The prices have also fallen from a peak of Rs. 4,158 per candy during 1951 to Rs. 677 in 1959.

2.125 The above evidence points to an increasing degree of competitiveness in the world markets for pepper, and India is fast losing ground to the new entrants. So far India has been able to maintain the volume of exports because of large off-take by USSR and other East European countries. However, demand from these countries cannot be expected to fully compensate for the likely fall in future exports to the USA and other Western countries. It may, therefore, be seen that for maintaining the existing level of exports, not to speak of increasing it, it is essential that Indian prices should be competitive.

2.126 Prospects for internal demand, on the other hand, seem quite bright. Between 1952 and 1958, internal demand rose by about 25 per cent from a level of 5,000 tons. In view of rising population and fast developing food processing industry, future internal demand is likely to maintain this trend.

2.127 Oleorisin, a pharmaceutical product, is extracted from pepper. A considerable amount of pepper in the western countries is used for extraction of this alkaloid. Oleorisin could be extracted in Kerala and an export trade developed out of this. This aspect needs further investigation.

Cardamom

2.128 Cardamom is the most expensive as well as the most delicious of all the spices. India produces about 70 per cent of the world output of cardamom. The

13;Thurston & Rangachari E-4, 5 (no date) 1909
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Nayar

342 always shade from the many trees and palms. Every house is in its own seclusion."

Concerning Nāyar dwellings, Mr. N. Subramani Aiyar writes that "the houses of the Nāyar, standing in a separate compound, have been by many writers supposed to have been designed with special reference to the requirements of offence and defence, and Major Welsh states that the saying that every man's house is [244] his castle is well verified here. The higher ambition of the Nāyar is, as has frequently been said, to possess a garden, wherein he can grow, without trouble or expense, the few necessaries of his existence. The garden surrounding the house is surrounded by a hedge or strong fence. At the entrance is an out-house, or patipura, which must have served as a kind of guard-[356] room in mediæval times. In poorer houses its place is [237] taken by a roofed door, generally provided with a stile [532] to keep out cattle. The courtyard is washed with cow-dung, and diverse figures are drawn with white chalk 346 on the fence. Usually there are three out-houses, a [343] vadakkettu on the north side serving as a kitchen, a cattle-shed, and a tekketu on the southern side, where [164] some family spirit is located. These are generally those of Maruta, *i.e.*, some member of the family who has died of small-pox. A sword or other weapon, and a seat or other emblem is located within this out-house, which is also known by the names of gurusala (the house of a saint), kalari (military training-ground), and daivappura [782] (house of a deity). The tekketu is lighted up every evening, and periodical offerings are made to propitiate 351 the deities enshrined within. In the south-west corner [312] is the serpent kavu (grove), and by its side a tank for [245] bathing purposes. Various useful trees are grown in the garden, such as the jack, areca palm, cocoanut, plantain, tamarind and mango.